Michael Roesslein:

We are just doing a Q&A webinar today. So we did the... And this is Kiran Krishnan. Everybody should know him by now, but I forget that we might have some new people. Kiran is one of the founders of Microbiome Labs and their chief science officer. Now works also with Novozymes in Denmark, one of the most sought after speakers in the functional meta space now which, if you listen to one of the videos we did about the origins of Microbiome Labs and MegaSpore, it was not always that way. And so it's been very fun to watch that happen, and they just hosted a great... What do you call them, micro keynotes or mini keynotes?

Kiran Krishnan:

Mini keynotes. Yep.

Michael Roesslein:

Mini keynotes event yesterday with Microbiome Labs. I caught Bree Weiselman, who we've had on also on there and a couple other familiar faces teaching. And so we did two webinars at the end of 2021 that were focused on the gut microbiome immune connection, a really robust, thorough presentation. If you haven't watched that one, we did send it out in a couple emails the last couple weeks and it's on the blog. I would go back and check that out. It's probably the most detailed, user-friendly presentation that I've ever seen on that connection between the gut and the microbiome and the immune system and how they all work together.

And then we had a webinar on SIBO, which is... I don't know, it seems like everyone has SIBO now. 10 years ago, it was like a thing nobody had heard of, and then five years ago, it was kind of and then now it's everyone. And so we talked about the physiology of it and how it gets formed or how it takes place and then where treatments tend to go sideways with that a little bit and why it seems to be something that people get under control for a little bit and then it comes back and then it comes... And it's this constant rigmarole. And it was a great presentation there, too.

And we received a ton of questions, and we decided to bring Kiran back to answer questions. So I have some from then and from the emails that I'm probably going to start with. And there's a Q&A, which seven people have already found. Nice work. There's a Q&A button on the bottom. I would ask that you put the questions in the Q&A that you have and not in the chat. The chat can get crazy and go really fast and questions get lost. I'm going to ask a few that I've been holding onto for a while. And then I'll get to those... I am going to prioritize questions that are related to those topics that those webinars were on first to some degree. And once we get through those, then I'll try to open it up to other topics. Linda, no, I don't think everyone really has SIBO, but it's become quite the go-to diagnosis across the functional medicine space. So, Kiran, you got anything to add or say or anything? You're at home? Is this your new office.

Kiran Krishnan:

This is my new office. Yep. I've got my buddy here, this Leo guy back here. I am a Leo, so I had to put him to watch my back.

Michael Roesslein:

The mane goes around your own head there, so that's good.

Kiran Krishnan:

Yeah. It's like I'm morphing into this lion. And yes, I've been traveling a lot because I'm back to flying around and teaching and lecturing. And of course, with our partnership with the folks in Copenhagen and Novozymes, we've got a lot of awesome stuff coming up research development wise. So I'm going to Europe a lot as well, which adds to the madness, but it's all good stuff. And we'll get to mention one of the new technologies that we just released that is a byproduct of working with this amazing biotech company. So lots of exciting stuff coming and lots of great research, and it's great to be back and be able to chat with you guys.

Michael Roesslein:

Awesome. Yeah, I actually have been out of the loop with my moving process. It was a little more involved and time-consuming and chaotic and stressful than I had anticipated. And I got an email a couple days ago about that new product and said, "How fast can we get this up and stocked and on the site and ready for the webinar in two days?" And they did it, so nice work, team. And so we'll ask you about that in a little bit. And I know we've had conversations before about how exciting it is for you to be hooked up with the capability that they have in the R&D budget that's much more friendly than the one you had before. And you get to work with a whole bunch of new strains of probiotics and enzymes and all kinds of really cool stuff to create some pretty sweet formulas that are unique in the industry. So let's get going with the Q&A.

They are back in stock, Stephanie, the mega mucosa and mega prebiotic. Yeah, I'll just say that now before we... We have every product, I believe other than the gut-specific fish oil, in stock now or this week. So everything that's been out of stock is back in stock, the Mega Micro Balance, which I wasn't even sure if you guys were ever going to bring that one back.

Kiran Krishnan:

Yeah. That one was-

Michael Roesslein:

I don't know what happened there.

Kiran Krishnan:

...totally elusive. Yeah. It was amazing that it came back.

Michael Roesslein:

And then the-

Kiran Krishnan:

[crosstalk 00:07:15]-

Michael Roesslein:

...mucosa, the prebiotic, everything's back in stock. I'll drop that in the chat in a little bit. And then there's a new one that's pretty cool for [inaudible 00:07:24] folks. So let's see here, SIBO related, somebody asks if there's a possible correlation between SIBO and histamine intolerance. They've experienced symptoms at both times, and they've seen it in their clients generally linked together. Is there something about the small intestine lack of motility that could link itself to a histamine intolerance situation?

Kiran Krishnan:

There could be. So if we think about the pathologies, so part of histamine intolerance... There's two parts to it, I think. Number one is it's the over activation of the immune system. So it's a robust response to the presence of histamine by the immune system. Now, in the case of SIBO, because you get this [inaudible 00:08:14] shift where, in the small intestine, you should typically have lots of gram-positive bacteria. When you have SIBO, you tend to have [inaudible 00:08:21] shiftogram to gram-negative bacteria. That in itself is very irritating to the lining of the gut, and it's very irritating to the immune system that's in the small intestine because now the immune system that typically doesn't deal with things like endotoxins, like LPS, is now dealing with the huge abundance of endotoxins and all that are being produced by the gram-negative bacteria.

So you've got a system that's already irritated, an immune system that is on high alert because remember, a large part of your immune tissue is in your small intestine. All of that is happening at the same time, which means that your immune system becomes triggered, becomes hypersensitive, and starts responding to lots of things that it normally wouldn't respond to. That's part of the time with the histamine response. And in addition to that, you may not be producing enough IgA in SIBO because you don't have the right bacteria mix in the small intestine doing the crosstalk with the immune cells in the epithelial lining of the small intestine, which means that you may not be producing enough IgA. If you don't produce producing enough IGA, then what happens is the natural recruitment of eosinophils and all that occurs in the basal lateral circulation right next to the intestinal lining to produce things like IgE.

So it creates a hypersensitive response system. So SIBO to me... And I think those of you who have heard my SIBO presentation... is not a condition of its own. It's a symptom of a bigger problem that's going on. And so it's not surprising that there will be other immunological issues, liver issues, stomach issues, gastritis, all of these things built in together that also presents with SIBO, because it's not necessarily the SIBO that's driving these things. It's what was the original root cause that allowed SIBO to happen that's also allowing histamine intolerance. It's also allowing liver dysfunction. It's also allowing gastritis and gastroparesis. All of those are connected because they're all being driven by the same underlying factor. So, absolutely, I think you can have histamine intolerance as a condition that is also present with SIBO, but it doesn't necessarily mean that you have to somehow treat the SIBO to get rid of the histamine intolerance or treat the histamine intolerance to get rid of the SIBO. There's some underlying root cause things that you need to deal with that'll get rid of both of those things.

Michael Roesslein:

Makes sense to me. Pardon the typing. I usually mute myself. I was answering some questions in the chat while you were answering that question. I didn't realize that. That makes sense. Thank you for that thorough

answer. Yes, there will be a replay. We should just say that at the beginning. That's always question number one. I'm trying to stick to... I posted the SIBO presentation in the chat. If it's a question that's answered directly in the SIBO presentation, I'm going to answer your question in the Q&A with that link and ask that you watch that presentation. The questions I'm looking for are ones that go above and beyond what was in the presentation or questions about the presentation, but it's super thorough. It's like 90 minutes of really, really, really thorough SIBO information. So I think that I'm going to try to stick to that. Have you done any research related to oxalates in the microbiome? That's one I'll just throw out while I'm weeding through some of the others.

Kiran Krishnan:

I have not. No, not specifically on oxalates. Oxalates are, of course, a reality of our diet. And for that reason, we have microbes in the gut that are really quite specialized in dealing with oxalates, in particular [inaudible 00:12:28] that really does a good job of breaking down oxalates. Now, it's also a sensitive of anaerobic bacteria, so courses of antibiotics and all that can certainly impact its level in the system, but there are redundant functions. So for example, the spores have been known to be able to break down oxalates as well. So I think if you have adequate diversity, if you're taking your spores, you should be able to deal with oxalates in general.

Michael Roesslein:

Is there a mega IgG powdered form? That's an interesting question because I just found out this morning that there is.

Kiran Krishnan:

There is. Yeah, we just came out with it. It's a powder form in the tub. Nothing else in there but the IgG. There's no flavorings or anything like that. It looks like most people like just consuming the IgG by itself or adding it into a smoothie or drink of your choice. It's a two-gram scoop, so you can dose it anywhere from two grams to as much as you'd like. I don't think that there's a high-end upper limit to IgG. I think there are significant impactful benefits at the five-, six-gram dose. So especially with somebody that's dealing with things like mold toxins and so on, you could really benefit from the high dose. That's part of the reason why we did the powder version.

Michael Roesslein:

Do coffee enemas and binders flush out probiotics or negatively affect the microbiome?

Kiran Krishnan:

Yeah, so those are two quite a bit different things. Binders and coffee enemas are quite a bit different. So let's tackle each one by themselves. Coffee enemas, I think if you do it as a retention enema, I don't see that it would flush out a lot of microbes. So I think one of the benefits from coffee enemas is that coffee has a lot of FODMAPs in them. And there's also a number of antioxidants and all that in the coffee, assuming you're getting good coffee. So if you do a coffee enema, you do it as a retention enema, you're holding it in there 15, 20 minutes, you'll actually get some prebiotic impact. You'll get some anti-inflammatory impact in the large

bowel. And then when you release it, it shouldn't be violent enough, if you will, of a flushing to really disrupt the microbes.

That being said, I wouldn't do it all that often. I wouldn't do that every day. I think that's something maybe you could do once or twice a week at most and gain some benefit from it. Binders, on the other hand, are a different category. So binders are like just a month sweeping through your system. The problem with binders is they will bind all kinds of things, good and bad. And so if you're basically having to use binders on a regular basis, you are going to be creating an impact on your good beneficial bacteria. You will be pulling micronutrients and other small molecules out with it. So that's part of the reason why we really like the IgG because the IgG is like an intelligent binder. It's a big, wide array of immunoglobulins. And these immunoglobulins bind to all kinds of things that are toxigenic in the gut: mold toxins, environmental toxins, viruses, bacteria, all kinds of things without binding to and removing any potentially beneficial items.

Michael Roesslein:

That's him. I did mute myself, but then I have to remember to unmute myself. I am posting links for people in the questions if we have a webinar and everything on the topic specifically. Let's see, can you speak to taking an herbal blend, such as Biocidin or Beyond Balance for gut restoration or mold or SIBO and how that might affect somebody with a history of c-diff or someone in general? You often don't talk about antimicrobials.

Kiran Krishnan:

Right. So, in my view, with antimicrobials, I think there's certainly a time and a place for it. It shouldn't necessarily be the knee jerk first-line response to anything that's wrong with the gut, because here's what's interesting that we're finding out. We have, of course, the biome effects test, and the biome effect's test is a really high level, high-end

PART 1 OF 4 ENDS [00:17:04]

Kiran Krishnan:

... really high level, high end, I mean, shotgun, full genome sequencing analysis, and we've done, now, thousands of them. So we've done five, six thousand of them, and we have data from a lot of it. Rarely do we see that the problem in someone's gut, or their immune system, is being driven by a pathogen. Pathogens can be problems, and often they play some role, but rarely is it that the pathogen is the key. Now there's a thing that's happened in the functional medicine space that makes all of the practice around the microbiome very pathogen centric. And part of that reason is because of the types of microbiome tests that were available, and still are, that are still the predominant tests that are used.

Many of these tests use PCR, and when they PCR, they PCR specifically for certain types of pathogens. Keep in mind with PCR, you have to know what you're looking for, because you have to create these little genetic probes to throw into the genetic mix to find the antigens of that genetic probe which is linked to a particular pathogen, and then it amplifies that genetic code over and over again so you can read it and detect it, and then talk about its levels.

The problem with PCR is, again, because you have to know what you're looking for, so it's narrowed to 12, 13 target candidates. So you could have lots of other pathogens in there that you're not detecting because you don't have a PCR probe for it.

Number two, PCR does also artificially amplify the relative abundance of the pathogen compared to the rest of the microbiome. Because more often than not with the microbiome, it's not as important who's there, it's who else is there. And it's not so much important what's there, but what's missing. And that's a key part to the microbiome because you can have pathogens, you can have opportunistic organisms, and all that. Totally fine. More often than not what is driving a health dysfunction is what's missing, what functionalities are missing within the microbiome.

And so when you use PCR based pathogen testing for the microbiome, it has created this mindset that everyone's gut who's not feeling well is somehow infected and dominated by pathogens, because that's what the test reads out to you. And it's not at all accurate, it's not giving you the context, it's not giving you the relative abundance, and because of that, then the automatic easy knee jerk reaction is antimicrobials.

So for the longest time, the way functional medicine approached gut health and microbiome therapeutics is, "Oh, you're not feeling well, it must be a pathogen. Here's a test shows it, and here's an antimicrobial to kill that pathogen." That became the most simplistic approach to it, when the actual approach is actually much more complicated and far less pathogen focused.

So when we do the biome effects test, for example, which is whole genome sequencing, not PCR, where we get a very accurate read on all the pathogens that are there, and then all of the commensals, then you start to look at the relative abundance of pathogens to commensals, and you start to see that very rarely do we have a condition where an individual has a very high abundance of pathogens that are disproportionate to their commensals, which leads to the idea that the pathogen is driving their condition.

No doubt, there's people with infections. You could have C-diff, that's an infection. You could have candida, that's an infection. So those cases, yes, you do have a pathogen or opportunistic driving an infection, but most people don't need to necessarily kill things all the time.

Now, going back to the original question, so I hope that makes sense because I think we need a paradigm shift, and I'm trying to drive that as much as I can, with clinicians as well. And that's really the terrain conversation, because we know that throughout COVID, and maybe a little bit before, this whole germ versus terrain theory thing, debate started happening in our space, which is a great debate to me because it really puts things back into perspective because really what we're looking at is the terrain dictates the outcome. And the terrain is made up largely of all the microbes that are in it. And it's not the presence of a single germ that's a problem, it's what else is around that germ to allow that germ to function the way it wants to or not.

So when we're talking about antimicrobials, Biocidin is interesting, they have some data showing that it does have some preferential ability to kill things like pathogens, more so than commensal bacteria. I use Biocidin spray quite a bit when I fly and travel and all that stuff, but I don't think that we need to really focus in on a process of killing, killing, killing, as we're trying to fix and repair. I think it's more important for us to try to reform the terrain so that if there is a pathogen that's causing a problem, that pathogen's effect will be minimized by the rest of the terrain.

That's a very long answer, but to me, it's very important that people reset their mind. It just was so common when I got into this whole function of medicine space, it was always like, "Oh, your gut's not feeling right? Something's wrong with my microbiome. It's got to be a pathogen. Oh, here's a stool test that says your pathogens are all out of whack, and then let's kill, kill, kill, kill." That became basically the only response. So, we want to change that paradigm and start working better on the terrain and supporting the rest of the functional organisms.

Michael Roesslein:

That's been your response to that exact same question for seven years.

Kiran Krishnan:

Yeah.

Michael Roesslein:

And what's cool is we have a podcast here and I've recorded probably, I don't know, 50 episodes in the last few months, and this topic has come up a few times, and there's been a number of practitioners who have voiced something similar in shifting gears away from killing everything, and saying that the bugs will do what they do in a certain environment.

Kiran Krishnan:

Right.

Michael Roesslein:

But if they're not in the environment, they won't cause the same problems, and it's not the bug itself, it's the environment, and working on the environment. And I'm hearing that way more now than I ever did before, so perhaps you're 62,000 lectures on the subject are starting to get-

Kiran Krishnan:

Resonating.

Michael Roesslein:

... to some of the people in the space. And some of them I've even heard say the exact same bullet points or talking points, so maybe those that are coming from you. I have a few questions, you mentioned Mega IgG and the powder, that now comes in a powder. Somebody also asked, it looks like there's been, Transferrin has been added to the Mega IgG formula, and why?

Kiran Krishnan:

So Transferrin was-

Michael Roesslein:

Or was it always there?

Kiran Krishnan:

It's been always there, we're just labeling it.

Michael Roesslein:

Okay. Okay.

Kiran Krishnan:

Because some of those proteins are considered Transferrin.

Michael Roesslein:

Okay.

Kiran Krishnan:

We continuously update our labels to be more transparent, to be more compliant, and all that. So for us, it's just a label update.

Michael Roesslein:

Okay, just [crosstalk 00:24:48] update label.

Kiran Krishnan:

Yeah.

Michael Roesslein:

Okay. There's a few questions on that product, so I'm just going to ask them all in a row. How is it different, because Mega IgG is a serum derived bovine immunoglobulin, which if people are familiar with colostrum, there's IgG in colostrum, but this is a dairy free way to do it, and these immunoglobulins can help balance the immune system in the gut, it can help bind to different types of antigens and pathogens and toxins and other sorted crap in the gut. And so people kind of use them as a, I wouldn't say alternative to like binders per se, but that's kind of the same concept, and how is it different from using digestive detox binder type things that have bentonite, cilium, other stuff like that? Can you just give a quick difference in how they function?

Kiran Krishnan:

Yeah, so immunoglobulins work more like a locking key mechanism. Because they're antibodies, and they are antibodies to specific things, they are designed structurally to identify specific compounds, bind to them, and neutralize them. That's a big part of our immune defenses in our system. We produce IgG ourselves in our serum and our circulation, and it's a big part of what defends us, long term, from things like pathogen and toxins and all that stuff. So it's a bovine serum IgG, which means that the cows that are out there in the pastures and getting exposed to all kinds of things, their immune systems are building antibodies against all of those things, all of the mold and viruses and bacteria and environmental toxins and all the things that they get exposed to, their immune systems are producing antibodies against each of those things.

Then, because we're able to extract that serum, and concentrate the immunoglobulins from the cows, that actually allows us to take these immunoglobulins, which then go into our system, and bind up all of these egregious things and take it out. The biggest difference is, this is highly specific for egregious compounds, it doesn't bind beneficial things, it doesn't remove anything out of the system that's beneficial. Whereas, the more non-specific things, like the clays and the charcoals and all that, just grab onto stuff and take it out. So it can take out beneficial organisms, it can take out beneficial micronutrients and all that. And so, to me, the IgG is really a significant advancement in the idea of neutralizing or reducing the toxigenic load in the gut.

And that, in fact, in many ways provides the immune system with the helping hand, because many of these toxigenic compounds will drive inflammatory responses in the gut. And if you have inflammatory responses in the gut, it supports the growth of opportunistic and problematic pathogens, or it supports the growth of fungus and so on, and it harms commensals. And then also, inflammation in the gut drives inflammation throughout the rest of the body. So, just by removing the toxigenic load in the system, and thereby reducing the inflammatory responses in the gut, it's modulating the microbiome, and it's modulating your systemic immune response as well.

And we've seen this because this same immunoglobulin has been in studies in HIV, endarteropathy patients, and ulcerative colitis, and so on. And most recently a completed study in COVID, with this particular ingredient, that was actually done in Spain, not in Italy. I thought it was going to be in your backyard, Michael, but no, it's in Spain. It was done in Spain, and so it's a tremendous thing to see how these system's biologies are connected. When you reduce the toxigenic load in the gut, which is where most of the immune system is present, and you reduce the inflammatory responses from that toxigenic load, because you're neutralizing it, then the rest of the system seems to work much better. So they saw this in the COVID study, where they were taking this immunoglobulin, and it's not like the immunoglobulin directly bound to the virus or anything like that, it just significantly enhanced the function of the immune system by reducing the toxigenic load. Clays and all that can't do that, so clays and all that are just nonspecific things that just grab everything and take it out.

Michael Roesslein:

Gotcha. Makes sense. I added that in for myself about a year and a half ago, just to kind of add a little added cleanup in my got, and I've been pretty happy with that. Does IgG bind itself to toxins only in the GI? Yeah, does that leave the GI track? The IgG? It functions in the GI track, correct?

Kiran Krishnan:

Yeah, there's no indication that it leaves the GI track.

Michael Roesslein:

Okay. And then someone asks, should take anything to improve motility using Mega IgG? Or is it a sign of something if using IgG causes constipation for somebody?

Kiran Krishnan:

Ah. The biggest reason why IgG may cause constipation in people is because of the increased protein intake and it has high water activity. So it can drive binding of water as well. So that in itself can make it harder to pass stool. What we've shown-

Michael Roesslein:

So drink lots of water.

Kiran Krishnan:

Yeah. If you drink extra water as you're taking high doses of it, it's totally fine.

Michael Roesslein:

[inaudible 00:30:30]. Okay. MegaSpore, I don't know what happened, something about MegaSpore and Rebel Health Tribe got posted in some sort of Facebook group in the last month and we got a few hundred people come into the Facebook group and send questions about it. And one that came up a few times, I think there was actually an argument, happens, in one of our posts. There's not much diversity in the formula of MegaSpore. So I know that you've done webinars with you, years ago, we actually haven't done one on MegaSpore, or probiotics, in so many years.

Kiran Krishnan:

Right.

Michael Roesslein:

It might be good to revisit that, but it's still coming from the paradigm that includes, more is better, more CFU's is better, more strains is better, and that the ones that you're going to put in your mouth are the ones that are then going to fill up your gut and recolonize everything. And that was kind of the thought paradigm with probiotics for quite a while. Can you just speak to that specific question or argument? It's five strains of bacillus species organisms, and that my answer to it is generally is what do these probiotics do when they arrive in the gut, versus what are they themselves? But can you just answer that question because we get it quite a bit.

Kiran Krishnan:

Yeah. Okay. So this is, again, this is one of those crazy things that were perpetuated within the natural products and functional medicine area before people were really understood the microbiome. So let's take,

for example, what you may consider a highly diverse probiotic product. Let's say you've got a product that has 25 different species in it, 18 of those species are lactobacilli species, and then the other there seven or so are bifidobacteria species, and then it's like a hundred billion CFU. Now someone may look at that and go, "Oh, see that's a diverse probiotic because MegaSpore only has five strains, this one has 25 strains, that's going to be better for your diversity." Well, no, for a few reasons.

Number one, most of those organisms don't survive through the gastric system, so it's not like they're going in, and living in the gut, and creating harmony. They will die going through the gastric system, as one. Number two, you can't increase diversity of the microbiome by implanting bacteria through probiotics because, even if you use a product like that, that has 25 different species in it, between lacto and bifido, you're only talking about two genus', the lactobacillus genus and the bifidobacteria genus. Lactobacillus genus is, in total in the microbiome, is about one percent of the total microbiome. Bifidobacteria is another three, four percent. What about the other 96, 97 percent of genus' that are in the system? How is that, quote unquote, diverse probiotic impacting the vast majority of the other microbes that should be in the system? And the answer is, it's not. So you cannot increase diversity by this idea of implanting probiotic bacteria in your gut, and implanting a huge variety of probiotic bacteria to drive diversity. If you are doing that-

Kiran Krishnan:

... probiotic bacteria to drive diversity. If you are doing that, what you are actually doing is doing a fecal transplant. That's where fecal transplants came from, because what they were seeing is that these conventional probiotic products didn't have enough species or genus diversity in it to really impact a lot of outcomes in the gut. And so they said, "Well, how do you get all of that genus diversity?" You take poop that has all of those genuses in there from a healthy donor, and then you try to implant that into the recipient rather than the probiotic, right? So, short of trying to do a fecal transplant, what you really need to look at is effector strains, effector strains that have the capability of changing the microbiome diversity. And we had been talking about this for a while because we understood that this is how spores worked, and we still kept getting this question from people.

And so we said, "You know what, let's use science to prove it to them." So now we've published a couple studies showing that when you add the spores in, because they're such good effector strains, they start rebalancing the microbiome. They bring down overgrown organisms, they produce a whole host of compounds to increase the growth of underrepresented organisms, thereby bringing about some uniformity and increase in diversity, right?

And we've published on this subject and hoping that science would alleviate this question, but I think most people don't have the capability of maybe finding those studies, and reading them and understanding them. So it becomes really important to know that if the goal is to increase diversity, you cannot do it by getting a quote, unquote, diverse probiotic and implanting those organisms. You can't implant them, most of them don't survive, they don't stay in the bowel, they're transient. And even if you have 25 strains in one, you've got only two genuses represented, and most of the microbiome is made up of anaerobic genuses that you don't find outside of the body. So what you really need to impact diversity is, you need an effector species that can go in there and start orchestrating and modulating the microbiome from the inside out. So hopefully that made sense.

Michael Roesslein:

Absolutely. I've almost got that one down to where I can repeat it verbatim, but you've always got new stuff to bring up though, that you talk about that research has come up and different things that have made that more clear. Talking about research, somebody asked, your HU58, which is a high dose bacillus subtilis probiotic, whether this strain of bacillus subtilis is the same, or similar, or how it differs from the one in Siberia shown to help in long COVID. Have you seen that?

Kiran Krishnan:

Sorry. Which strain? The-

Michael Roesslein:

The HU58, the bacillus subtilis, apparently there was a study that came out, I guess, from Siberia, showing helpful bacillus subtilis in long COVID. Did you see that or no?

Kiran Krishnan:

No.

Michael Roesslein:

Okay. Maybe you should look that one up. That sounds relevant to you.

Kiran Krishnan:

Yeah. From a study, from Siberia on long COVID?

Michael Roesslein:

That's what it said. Yeah.

Kiran Krishnan:

Okay.

Michael Roesslein:

Where are they? Any suggestions for oral microbiome? Now you brought up oral microbiome quite a bit in the CBO presentation, I am still working on getting something put together for a webinar on that. I also just got smashed with way more stuff with this moving and immigration process than I'd anticipated. So my January, February just flew by and didn't even really happen and I don't know what happened.

Kiran Krishnan:

Right.

Michael Roesslein:

So now I'm kind of back to work, but I'm going to try to get a presentation put together on that, bring in a functional doctor or dentist or two. But from a microbiome perspective, do you guys have any plans to create something that's oral microbiome related? Or do you have any tips or recommendations off your head for that?

Kiran Krishnan:

We do, it's actually in the works. We have a product called Bio-Fresh Clean. Bio-Fresh Clean is a enzyme based product that's designed to break down plaque, right? So a big driver of oral dysbiosis is that accumulation of plaque. Because what tends to happen is each little layer of plaque, each micro layer of plaque creates a slightly different micro environment because the plaque becomes more, and more and more anaerobic as it builds up. And so, as you get deeper and deeper into the plaque, you get more and more anaerobic, and that allows sort different types of microbes to grow in the mouth that normally wouldn't be able to proliferate in the mouth.

And so what we're seeing is that if you start being able to break down the plaque and maintain lower levels of plaque in the mouth, that it actually improves the oral microbiome. At the same time, when you use the MegaSpore through the oral route and reduce LPS, you'll reduce inflammation in the gum lining, which then changes what the microbiome of the oral cavity looks like from the outside because one of the drivers of problematic bacterial growth in the gingival tissue is inflammation in the gingival tissue.

And a lot of that inflammation comes from LPS making its way to the gingival tissue from the inside. Then that inflammation will drive a change in the local microbial environment and allow microbes to form biofilms and all that and increase pathogen growth. So between MegaSpore taking it on the inside, and then the Bio-Fresh product, the Bio-Fresh Clean that's coming out, probably in the second half of this year, you should be able to really modulate your oral microbiota.

Michael Roesslein:

Cool. And yeah, keep an eye out for that. I'm trying to actually book, starting in May I believe or June, we're going to try to do two webinars a month. Right now we're doing a ton of restructuring. I just brought in a bunch of writers to create a ton of cool content. So we're doing a ton of stuff right now, planning wise, but starting this summer, we should have two webinars a month.

And I'm eyeing one on oral microbiome and oral health specifically, because that seems to be the hottest topic in functional medicine right now, or one of them, on how the oral health situation correlates to just about everything else. And go figure, your mouth is also part of your body. I love how they treat it differently in medicine, you get the health insurance and then the mouth insurance, like the dental, but at what point did my mouth get removed from my body.

Kiran Krishnan:

Right.

Michael Roesslein:

Microbiome and Parkinson's, there's three questions on that. I've seen some studies come out in the last year or two linking certain organisms, I think, or dysbiotic organisms that they're then finding in the brain or that they come from the guts of the brain. Have you been keeping an eye on that at all? Did you see those studies and can you kind of translate for us a little bit?

Kiran Krishnan:

Yeah. In general, it's all LPS again, lipopolysaccharide, leaky gut. LPS translocating and accumulating in areas like the enteric nervous system and then eventually in the central nervous system as well. So when LPS accumulates in the neurological tissue, it causes damage to the neurological tissue, which then of course leads to neurodegeneration. And one of the byproducts of that damage is a compound called alpha-synuclein. Alpha-synuclein is a compound that can be measured and can be followed based on the process of, and the progression of Parkinson's disease. Right? So studies show that alpha-synuclein in early stage Parkinson's disease accumulates first in the gut lining, sorry, in the enteric nervous system, so in the gut. And, so one of the early stages of Parkinson's, one of the symptoms, is constipation because that alpha-synuclein is damaging the neurological response in the enteric nervous system. That's a neurological system, that's a nervous system that coats your entire digestive tract.

And when that system is compromised, you are going to get constipation because the bowel movement signals from the brain aren't making its way all the way to the gut. That acid, alpha-synuclein, accumulates and moves up. It can move into areas like the olfactory system that will then reduce the acuity in smell, and the ability to discern different smells from others. That's another early stage indicator of brain inflammation. And then finally it goes into the central nervous system where you start seeing symptomologies of Parkinson's, right? Of Frank Parkinson's. So it is all intestinal permeability and driven by endotoxin exposure. It's a neurological damaged condition, same with Alzheimer's, very similar pathology. Alzheimer's is basically LPS, the endotoxin, making its way to the perinuclear regions of the brain where it embeds itself, causes inflammatory responses and causes damage to that part of the brain. And when that part of the brain gets damaged and not repaired adequately, you start building these plaques, these, what they call beta plaques, in that region.

Michael Roesslein:

Makes sense. I have a few questions about fulvic acid and humic acid. I know that there's some products on the market that make a lot of claims around fulvic acid and humic acid. I have never seen any actual compelling data, or studies, or research or anything about it, or to have them actually able to explain the mechanisms with which the things work. Cellcore is one brand that I would bring up that makes a lot of claims around that. I do take their TUDCA bile acid salts and kidney liver support products, so I don't have a problem with the company. That's my own personal feedback on fulvic and humic acid. Have you looked into that at all, and some of those products and claims there or what's your feedback on that?

Kiran Krishnan:

Yeah. So the simple story of fulvic and humic is that they are minerals that microbes seem to be attuned to, certain classes of microbes. And, probably the reason is because those are quite abundant in certain soils and

those microbes have adapted to be able to utilize them in their metabolic processes. So then the idea is that if they're good for the microbes in the soil, then perhaps they're good for microbes in the gut as well. And I think it does translate to some degree. I think there is a benefit to some degree of taking in fulvic and humic.

Some companies do market it as kind of a cure all for everything. You just take some fulvic and humic, and it resolves everything. It resolves leaky gut, it resolves this, that, and the other. I wouldn't think it goes that far, but I think it's going to be supportive to the microbiome and it's probably going to provide some benefit to the microbiome. But again, without them doing research, the companies that really market fulvic and humic as kind of a cure all, it's really hard to know what it's actually doing in the system. But I would say there's no harm in taking it. And there's probably some benefit, but is it's probably not the panacea of curing everything.

Michael Roesslein:

Okay. Yeah. Yeah, I've just not seen a lot of evidence to back up a lot of the claims, but I do take a couple of the things. So I don't want to come across as bashing all of that. Andy's asking, and this was an emailed question that I was sent, H pylori infection, which is the focus of the new high, low guard, I believe it's called. I just found out about it, so I'm totally in the dark. I read what was in the email that went out to the practitioners, so I know that much. And H pylori is an organism that lives in the stomach and upper GI, naturally and it tends to get overgrown in certain situations, like if you have low stomach acid or high stress. I believe both of those have been shown to lead to overgrowth in H pylori.

And then the overgrowth is linked to gastritis, and acid reflux and all these other types of problems. So then the typical approach is to bomb the hell out of this with a whole bunch of things that is known to kill H pylori, which is actually difficult to do. So there's mastic gum, and there's the matula tea, I believe it's called and some other thing, which is insanely expensive. I didn't know that, but it's a really expensive tea.

But then you've talked to some of our webinars about how this is a commensal organism that belongs in the gut, you can't kill all of it. You won't kill all of it, yet it is a problem when it's overgrown. And he asked... He probably didn't know, just like I didn't know, that there was something specific to H pylori. Does MegaGuard and MegaSpore remove the need for antibiotic therapy to eradicate the H pylori and threat of long term health risks, such as ulcers and stomach cancer? What about HU58 or sac boulardii? And how accurate is a 16 S sequenced, medium, high positive for H pylori? So there's a bunch of questions in there. Eradicate is a word that you might want to touch on. And then the products that you guys make, what's relevant to H pylori, and what have you seen being an effective way? And then how accurate or serious is the 16 S sequence medium, high positive for it? Sorry. That's a lot, trying to condense.

Kiran Krishnan:

Yeah, no, no. All that fits together, so shouldn't be a problem to answer that. Okay. So first let's talk about H pylori and what it does in the system, right? So then we can kind of understand what needs to be done, if anything. So most people get infected with H pylori early on, sometime as a child. The latest estimates are that over 50% of the population has infectious levels of H pylori. I'd be surprised if you can find people that don't have any H pylori in the system, because it's just so ubiquitous and prevalent, and it spreads very easy from person to person, right? It's spread through saliva, it can spread through fecal matter, but that's probably

less of a spread. It's spread through contaminated food and so on. But saliva, intimate, kissing, sharing food and utensils, all of that stuff spreads it.

So it is quite prevalent, it's there. And again, when it gets to be infectious levels above somewhere around 10 to the five CFUs per mL of aspirate in the stomach, it starts to become a big problem. Now, why is it a problem above that level? So what H pylori does is, of course it bores into the mucosa, it makes its way into the gastric epithelium, that's the lining of the stomach. And one of the things that it does is, even though it is acid tolerant, hence it can exist in the stomach, it actually prefers a slightly higher pH than what's normal in the stomach. So to buffer the pH in the stomach, it produces a enzyme called urease. Urease then takes hydrochloric acid and it converts it into ammonia. So it's producing ammonia in your stomach.

For the H pylori, what that does is it brings up the pH, right? So it makes it less acidic in its little environment, so it makes it more comfortable for that bacteria. For the host, that ammonia is highly toxigenic and inflammatory to the gut lining. On top of that, H pylori also can and produce these enzymes called mucinase, that will break down the mucus layer of the stomach as well. That, of course, the mucus layer is very important as a protective barrier, it also protects the stomach lining from its own acid, right? That's how the stomach can actually stand the acid, whereas other parts of the GI tract wouldn't be able to stand that level of acidity because of that mucus layer. So H pylori is in there breaking down the mucus. It's going to let the stomach acid hurt the stomach lining cells more, and thereby cause things like ulcers and so on, peptic...

PART 3 OF 4 ENDS [00:51:04]

Kiran Krishnan:

Lining cells more and thereby cause things like ulcers and so on, peptic ulcers. The other thing H. pylori has, is it's a gram-negative bacteria, so it has LPS. So then its LPS drives all kinds of inflammatory responses in the lining of the gut, which then translates to the rest of the body, and that LPS can actually translocate past the lining of the stomach into circulation and cause a whole bunch of other problems, like we've talked about LPS before. Probably the most egregious part of H. pylori, though, is the fact that it has certain compounds, like one called CagA, that is actually a cancer-driving compound. So that's why it's responsible for certain types of GI cancers, stomach cancers, adenocarcinomas, for example.

So it has a number of things about it that when it's levels are high enough, it's causing enough inflammation, enough toxicity, enough disruption to the lining of the stomach, enough systemic inflammation, enough oncogenic inflammation, oncogenic inflammation means the type of inflammation that leads to the formation of cancer cells, that at that level, it starts to overwhelm the system and cannot be controlled. And then it can lead to everything from its most basic symptomology, which is gastric pain, bloating, slow gastric emptying, reflux and all of that, all the way nausea, dizziness from time to time, all the way to very serious things like gastric cancers. It is also tied to a number of organ system conditions like heart disease, liver failure and all that, because of the chronic inflammation that it causes.

So, sure enough, it is a problem once it increases above a certain level, and that means that we do have to keep it under control or in patients and people that are experiencing those symptoms, we certainly have to try bring down the levels. It's very hard to eradicate it, meaning removing 100% of it from the system. It becomes an exercise in controlling it. And so we don't know if the spores control H. pylori we haven't done a study on that. And because we didn't know that, we produce a product called MegaGuard that has a licorice

extract that has been shown to be able to modulate healthy levels of H. pylori. But even that's not enough, so that's why we came back with a new product called PyloGuard.

PyloGuard has a Lactobacillus reuteri strain in it, it's a post-biotic, meaning it's not a live strain, it can be and it functions perfectly well in its dead. It has an affinity for certain cell membrane structures of H. pylori. So, because it has that affinity, it actually binds to H. pylori, agglomerates it, and takes it out of the system completely. Now, will it eradicate H. pylori? No, it won't bring it down to a zero level, but it will bring it down below the level that it is a problem. So that is really, at the end of the day, the crux of it.

I haven't seen great data on some of the other teas and gum and mastic gum, things like that. And again, if you're using things like gums and all that, it's not just specific to one thing. It's going to bind up a bunch of stuff and start changing. It's like an antibiotic. There is a triple-therapy antibiotic protocol for H. pylori. You can use it, it's definitely going to bring down the levels of H. pylori, but then it's all also going to cause a lot of other problems, because it's going to harm other things.

This PyloGuard strain only binds H. pylori. So when you take it, it only grabs onto the H. pylori and takes it out of the system. It doesn't impact anything else. So with H. pylori, my focus is always control the levels. And if you can do that control gently without harming a bunch of other stuff, then that's the best route to go, because it is pretty ubiquitous. So even if you get the levels down below a certain level and you're in a good place, the likelihood that your household members also have it and that you'll be reinfected or reintroduced is there, so you need to be able to maintain it or have a solution to maintain low levels of it.

Michael Roesslein:

Perfect. Two things. One, I just put a link and links and coupons and things in the chat. We're running a special on all Microbiome Labs products to celebrate a whole bunch of things coming back in stock and the PyloGuard coming out, so 15% off all Microbiome Labs products with that coupon for a limited time, I believe that's going to go util the weekend. That's in there a link to the PyloGuard product page. I also put something in there for you, Kiran, that's a follow up to the HU58 question, and it has information about the study in Siberia with the Bacillus subtilis and the long COVID. I figured you might want to follow up. And Trisha, thank you for sharing that. I'm sure Kiran likes to read studies and will find that one and read it.

Just a couple more, you probably got to go right in a minute or at about an hour.

Kiran Krishnan:

Yeah.

Michael Roesslein:

Okay. I have a few people that started MegaSpore. There's, like, 10 questions I'm going to try to put into one about MegaSpore and HU58. Some combination or relative similarity to the story of either started taking it, the symptoms they were trying to alleviate got better, but then they got some other things or there was some reaction to it, or they got better, things went away for a month, 2 months, 3 months, and then things started to come back. I guess, dosing wise and what to expect, there's a lot of really sensitive people in our audience,

like Lyme disease and other chronic health conditions and chronic infections and things like that that are really sensitive. I also had a few questions, "I'm hypersensitive to everything."

So, can you just talk about, we've had people that have started as little as a quarter of a capsule every other day for the most super sensitive of people. There's one in the Facebook group who always chime in on this, because she had to start at half a cap every third day, 5 years ago, and now she takes two a day and most of her digestive symptoms have been gone for years. Can you just comment on that? What's actually happening when somebody has something they might not enjoy happen if they go to too fast with it?

Kiran Krishnan:

Yeah. It's really a die-off timer reaction and the intensity of the reaction will depend on a couple of things. Number one is, how leaky is your gut at the time? If you've got a super leaky, then the endotoxins that the bacteria that are dying off release will have a more profound impact on you. Number two is your tolerance level for discomfort. That's also a factor, because some people will tolerate a certain amount of GI pain and just go, "Well, that's kind of normal." And others, a little bit will be a huge impact to them. And so we find that as well. So it may be a tolerance level issue as well.

But nonetheless, all of it is a good sign because what we want ultimately is changes happening in the microbiome, and those changes, in many cases, will start with things that are uncomfortable. Basically, when the spores go in there and start competing with other microbes and competing against pathogens or problematic organisms to begin with those problem, those problematic organisms will fight back and they will release things like toxins and all that to try to survive the battle against the spores. And that's really what you're feeling. And again, how intensely you feel it will depend on what your microbiome looks like, how leaky your gut is, and of course, your tolerance level for discomfort.

So it's a good thing, it's just a matter of going slow and working your way up. But eventually, everyone gets up there. Vast majority of people will be at two caps in 3 weeks. There are some outliers that it takes months upon months to get there. But again, that response is a good thing. It's indicating a change occurring in your microbiome.

Michael Roesslein:

Okay. You got time for one or two more, or you got to run?

Kiran Krishnan:

Yeah, let's do one or two more.

Michael Roesslein:

Okay. Trying to group some together. There's three or four questions about antibiotics and recovering from antibiotics. You had a study done with the MegaSpore and the MegaPrebiotic, correct, together? I think that's on your site. I think I found it.

Kiran Krishnan:

Yeah.

Michael Roesslein:

Just General, yeah.

Kiran Krishnan:

Yeah. On an antibiotics, it was actually just two spores, it was a subtilis and the coagulants. We didn't even use the prebiotic in that. But we're now doing a much larger scale antibiotic-associated diarrhea study in kids to look at antibiotic damage, diarrhea that occurs, and then what happens when you take the spores with it. But in general, what we saw was that a 7-day course of antibiotics really leaned the microbiome towards this inflammatory dysbiotic, leaky gut type of microbiome. And then we also saw, because we studied intestinal permeability in that, we also saw leakiness in the gut happening. Then we started adding in the spores, just the two spores in this case, and we started seeing a reversing a more of those conditions. So yeah, it was quite exciting to see that the spores were able to go in and start repairing the damage that the antibiotics caused.

That's very similar to another study that we have completed that's been submitted for publication, and that's the damage that glyphosate causes on the gut and then the ability of met of MegaSpore to be able to start reversing the damage that glyphosate has caused in the gut. And in that study, we maintain the exposure of glyphosate. So it wasn't that the glyphosate was removed and then there was no more glyphosate in the system, but we maintained the exposure of glyphosate. And even in the presence of glyphosate, the spores were able to keep walking back the effect and start re-increasing diversity, increasing short-chain fatty acid production, and so on. So, the spores we have now evidence on. And then we had one more human study on hepatic encephalopathy, and these were people taking rifaximin every single day of their lives, and they were taking the HU8 with it, and we saw significant improvements in their GI function, including a significant reduction in ammonia levels, which is the scariest part for those patients.

So, absolutely. I think the key is if you're on antibiotics, then you definitely want to be the spores while you're on antibiotics. We have a protocol, which I'm sure at some point you've put up, Michael, where you do the RestorFlora, the HU58 and the MegaSpore, you do two each.

Michael Roesslein:

Yeah, yeah.

Kiran Krishnan:

And you do that for about three-times longer than the course of the antibiotics. And then after that's done, then you just go on MegaSpore as your maintenance. The prebiotic will really, really help with regenerating some of those keystone species and all that. So you can actually recover from antibiotics. You don't have to be super scared of them. If you have to take it to improve your health and fight off a bad infection, it's fine because you can recover from it. Of course, we don't want to abuse antibiotics, but we do want to take them when it's needed.

Michael Roesslein:

Okay. All right. Everything's back in stock, right? I think we got everything back in stock, because the MegaMucosa and the prebiotic had been out, the prebiotic also now has capsules, there's capsules and a powder of the prebiotic. I just saw the email that you guys are making new flavors of both of those, so our backend tech team is going to work to get everything set up. But we do have the PyloGuard in stock. I put the links in the chat, along with the shop link and a coupon from Microbiome Lab's celebration of things being back in stock, because we are out of quite a few things for quite a while. But the MegaMycoBalance, which we didn't talk about today, is their product that's specific for yeast. It's a undecylenic acid and bee propolis, I believe, and it goes after candida and yeast overgrowth from both the hyphae and the little thingies and the reproduction end of things, from my recollection from a webinar 3 years ago. That product had been gone for, like, 6 months. The Mucosa was out, that's back. We're getting the powdered IgG in, which we were talking about.

Everything is in stock. Everything's loaded. You guys are not the only ones that have been dealing with inventory and stock issues and transport things, and so we appreciate the hustle in trying to get everything back in stock. I'm sure that you were getting a couple messages and emails the last little while.

Kiran Krishnan:

The last 4 or 5 months. Oh, it's been rough, but [crosstalk 01:04:33].

Michael Roesslein:

Yeah. So it's got to feel nice to have everything back.

Kiran Krishnan:

So I can understand it. It's not like having out of stock of your favorite shampoo. It's your health.

Michael Roesslein:

It's, yeah, something that helps you feel better. You guys will get an email with the recording of this and some details on the stuff that's back in stock. I apologize. There's so many questions. We got to about 40 questions out of 60-something. I did my best. Kiran, thank you for sharing so much so freely. And we were kind of all over the place, but I think there's common themes in most of those answers that kind of tie back together. It's really about building the terrain and with healthy diet, diverse diet, lots different diverse foods and stress management and all of that. And then you guys have created an incredible... I remember how excited I was when you made your second product, which was the K2, the MegaQuinone. Yeah. I was like, "Cool. There's another product." Because the MegaSpore was so life changing for so many people.

And now I went on your site yesterday, because I'm pulling some studies to create a blog post around MegaSpore and the studies that have been published, and the product list, I had to scroll.

Kiran Krishnan:

Crazy, right?

Michael Roesslein:

Yeah. And they all have very specific uses. It's not like it's, everybody take these 22 products for your whole life. There are very specific uses, so you're giving practitioners an incredible toolbox to work with of unique things. Like, I don't see you guys putting out stuff that's already... If there's already six of them on the market and they work just fine, like, why bother?

Kiran Krishnan:

Totally.

Michael Roesslein:

So, they're really unique and now you have this toolbox of fun things to play with of these different organisms. I'm seeing the PyloGuard and the ZenBiome ones, which we didn't talk about today, which are the psychobiotics that affect mood and sleep and those kind of things. So, it's going to be fun. I need to pay closer attention so I get more than a day heads up when new things are coming out so that I'm not scrambling to learn about it myself before we host the webinar. But the mini keynotes, too, I think are going to be up on your website somewhere.

Kiran Krishnan:

They will.

Michael Roesslein:

People can find those and sign up to watch those. They gave a great series of presentations yesterday. I think there was four or five or something on different types of infections. I know Bri did one on yeast and candid, there was H. pylori and other things. Those were great. Thanks for that. It's to see you. Let's try to, I don't know, I know sometimes you just get called and you go to Copenhagen.

Kiran Krishnan:

Yeah.

Michael Roesslein:

But yeah, if you get a heads up and you know a trip that you're going to be making there or a visit, let me know.

Kiran Krishnan:

For sure.

Michael Roesslein:

I can go over there because traveling here is super cheap and easy to get there. And Graham Jones from Nordic Labs has invited me to hang out at their place there as well.

Kiran Krishnan:

Awesome.

Michael Roesslein:

So we'll go film something in Copenhagen on site at the lab.

Kiran Krishnan:

Love it. That'd be awesome. That'll be fun. I'll definitely let you know. I will certainly be there again in the next few months, so look forward to that.

Michael Roesslein:

Cool. Yeah. Thanks a lot, man. It's always great to connect.

Kiran Krishnan:

You too. Bye, Michael.

Michael Roesslein:

Thanks, everybody.